

# The Conidae of Fiji

(Mollusca: Gastropoda)

BY

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Vatukoula, Fiji Islands

(Plates 12 to 18; 3 Text figures; 1 Map)

THIS FAUNAL STUDY comprises the existing knowledge of the genus *Conus* from Fiji waters. The majority of specimens have been reef-collected, while others were obtained through dredging to a depth of 16 fathoms; subsequent dredging in deeper water may very well bring to light additional species. Only shells collected by the author and collectors residing in Fiji were used in the compilation of statistical data and specific records.

The majority of *Conus* species recorded from Fiji have an Indo-West Pacific distribution; three species reach as far as the West Coast of America.

Notes on the geography of the Fiji Islands and other pertinent data have been given in a previous publication (CERNOHORSKY, 1964).

## HABITAT AND VARIATION

During the daytime animals of *Conus* remain buried in sand or hidden under coral boulders and crevices of the coral reef. They are mainly nocturnal, and certain species, such as *Conus eburneus* HWASS in BRUGUIÈRE may be found at night exposed on reef-flats and among weed, in large colonies. The various *Conus* species have their preferred habitat, living either in stretches of sand, or are completely or partially buried in sandy substrate under coral boulders, or even inhabit crevices of coral reefs. It has been noticed that juvenile animals prefer the slightly deeper off-shore waters to the intertidal reef area where most of the adult specimens are found.

The colour and arrangement of design on the body whorl of *Conus* is one of the most variable features; certain species, such as *Conus magus* LINNAEUS and *C. lachrymosus* REEVE are more variable in this respect than others. The height of the spire is another variable feature; the spire itself will range from concave to convex in certain specimens. In large series of populations aberrant shells appear less obvious as there are many intermediate specimens connecting the normal form with the extreme variant. Only through study of large series of shells of a given species can one appreciate the actual range of variation within that species.

Juvenile shells, when only one sixth of their ultimate adult size, already display a nearly completed colour pattern; they will, however, have the waxen appearance and strong spiral ridges and granules characteristic of juveniles. The thin lip in *Conus* cannot be interpreted as a sign of immaturity, as thin-lipped specimens may be sexually mature and have been observed in the act of oviposition.

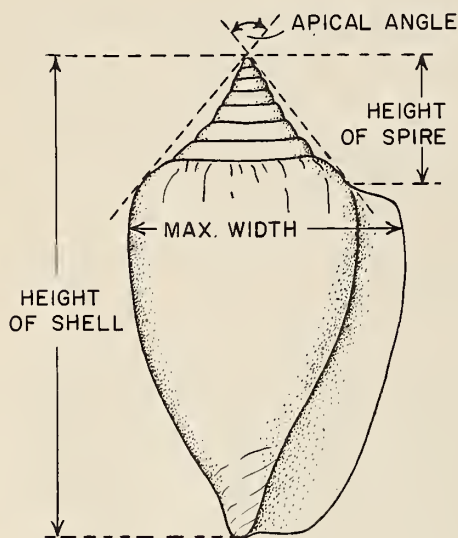
## THE ANIMAL

Part of the foot is responsible for the deposition of colour and pattern on to the shell, while the sole of the foot is used for locomotion. The siphon takes in water and keeps the animal supplied with oxygen; the tentacles are tactile feelers and on them are situated the eyes. The proboscis assists in feeding and is responsible for the delivery of the radula tooth to the victim.

The radula of *Conus* consists of two teeth per row; the teeth taper anteriorly and are barbed at the end. Posteriorly they are attached by a ligament to the radula. The tooth is either hollow or grooved along the surface, forming a narrow canal. One tooth is detached from the somewhat L-shaped radula sac, enters the pharynx and is securely gripped by the proboscis. At the moment of attack, poison is secreted from the venom bulb and passes through a tubular duct into the esophagus and to the tooth, which is then thrust into the victim. The tooth remains firmly anchored in the victim's flesh, and the action is repeated, if necessary. *Conus* feed in nature on annelids and on other gastropod mollusks and have been observed to kill and consume one of their own kind.

KOHN, SAUNDERS & WIENER (1960) reported the crude venom of *Conus* to be yellow, viscous and granular in appearance, with protein and carbohydrate present. The composition of *Conus* venom is very complex; it is, however, highly neurotoxic and death is due to respiratory failure, preceded by heavy salivation, chest constriction and convulsions.

The study of ENDEAN on venomous cones (1962, p. 5) revealed that piscivorous members of the genus *Conus*,



Text figure 1: View of *Conus* shell, showing measurement recorded.

such as *C. geographus*, *C. tulipa*, *C. striatus* and *C. catus*, possess venom which is toxic to all vertebrates, while the venom of molluscivorous species has no effect on vertebrates. Some vermivorous species possess venom capable of inflicting some local tissue damage in vertebrates.

*Conus* bites can prove fatal to human beings; KOHN (1963) recorded 37 *Conus* stings, 10 of which were fatal. During 1963 two more fatalities were reported by Australian newspapers as having occurred in New Guinea and New Caledonia. Collectors are advised to handle *Conus* at the shoulder, which is well away from the proboscis. Should, however, a bite be inflicted it should be treated the same way as a snake bite.

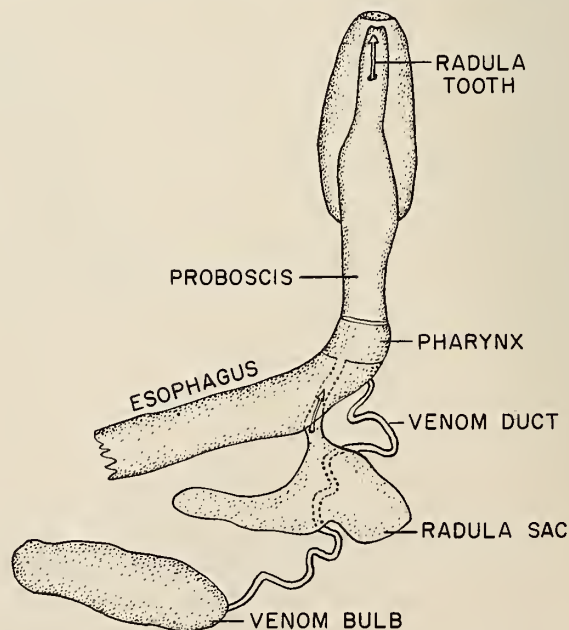
The few egg cases of *Conus* observed in Fiji were usually laid in a cluster or in parallel rows and firmly anchored to the substrate; the height of egg capsules varied from 6 mm to 26 mm; capsules were of a generally oval shape, coloured, and with either a smooth or a ridged surface. In one instance, 14 *Conus leopardus* were observed congregated in a circle around some egg clusters, with their bases pointing toward the centre of the circle. It is assumed that egg laying is a family affair, as it seems highly improbable that all 14 individuals were females.

#### CLASSIFICATION

The identification of the shells conforms to the present day knowledge and interpretation of the various species of *Conus*. The nomenclature of the genus, however, is at present in a transitional stage of confusion due, no doubt, to the excess of synonyms, homonyms, colour forms and

plain ecological variants. A great number of type specimens have become lost or destroyed, while those that are extant are not easily accessible. Many original descriptions are too short and ambiguous for positive identification and often lack accompanying figures; those which are illustrated show figures which are of a dream-like quality, and are often exaggerated. Certain species, such as *C. achatinus* GMELIN and *C. monachus* LINNAEUS, have through the ages been interpreted by different writers in various ways. To add to the confusion, many early writers named a specimen, not a species; the lack of reference material was largely responsible for it. Workers may therefore be tempted to re-describe as new all dubious species, either to bring order into nomenclature or just to escape uncertainty of correct interpretation. It is to be preferred, however, to try to match nameless species to the most appropriate descriptions and illustrations already in existence, instead of creating possible further synonyms. In a number of instances this may not be an easy matter, and results will vary according to the personal concept of, or interpretation of type-figures and descriptions by the various workers concerned. Unless the whole group of *Conus* is thoroughly revised by tracing every single species back to its original author, his description, illustration and type-specimen, and unless pertinent synonymy is compiled, the correct interpretation of certain species of *Conus* will remain open to dispute.

Various attempts have been made to split the genus *Conus* into further genera and subgenera. MONTFORT



Text figure 2: Generalized view of the venom apparatus and part of the anatomy of *Conus*.



(1810), SWAINSON (1840), and MÖRCH (1853), all established new genera, and IREDALE (1930), and COTTON (1945) added others. COTTON (*l. c.*) distinguished no less than 14 groups comprising 30 genera, and in a recent paper (COTTON, 1958) split the genus *Conus* into 3 subfamilies and 25 genera. MORRISON (*vide* DODGE, 1953) arranged LINNAEUS' 32 species of *Conus* in one genus, 13 subgenera and 8 sections on the basis of sculptural differences.

The dividing of *Conus* into genera and subgenera has usually been based on single characters such as sculpture, colour, height of spire and general shape of shell; these characters are, however, more appropriately used in distinguishing species, not genera. Dr. Kohn (*in litteris*), when referring to the use of single characters, points out that in a "generic" arrangement based on sculptural characters the arrangement of species differs markedly from one based on the use, for example, of radula characters.

Confusion exists even among the subdividers of *Conus* in regard to the correct "generic" interpretation of the various morphological characters. The well-known species, *Conus striatus* LINNAEUS, has been placed in the genera *Conus*, *Cucullus*, *Leptoconus*, *Tuliparia*, *Chelyconus*, *Phasmoconus*, *Dendroconus* and *Pionoconus* by various writers. It is obvious that single shell characters are poor criteria indeed for generic arrangement, if they can be interpreted by a few authors in so many ways. A generic division of *Conus* will always appear artificial if based on morphological characters alone; due consideration should be given in such an arrangement to fossil records, radular characters and the living animal. GLENCH (1942), KOHN

(1959) and HANNA (1963) do not support a further subdivision of *Conus* for similar reasons.

Dr. A. Kohn was kind enough to communicate to me his opinion on the value of radula teeth for use in comparative studies of species. He is of the opinion that certain groups of *Conus* species with similar shells (*e. g.* *textile* group) have also similar radular teeth; in such a case the latter are of little value in solving taxonomic problems. Certain other species groups with similar shells can be readily separated on the basis of radular teeth: *Conus lividus* from *C. flavidus*, *C. flavidus* from *C. frigidus*, *C. betulinus* from *C. suratensis*, and *C. ochroleucus* from *C. radiatus*.

#### METHODS AND OBSERVATIONS

Large series of most *Conus* species were available for statistical measurements with the exception of very rare species; in the latter case the range listed does not represent a true indication of the actual limits of variation.

To show the range of variation within a species the minima and maxima of height and width, height of spire and apical angle have been recorded. The abbreviations used have the following meanings:

H ==Height of shell from apex to base in millimeters  
W ==maximum width of shell expressed in per cent of height

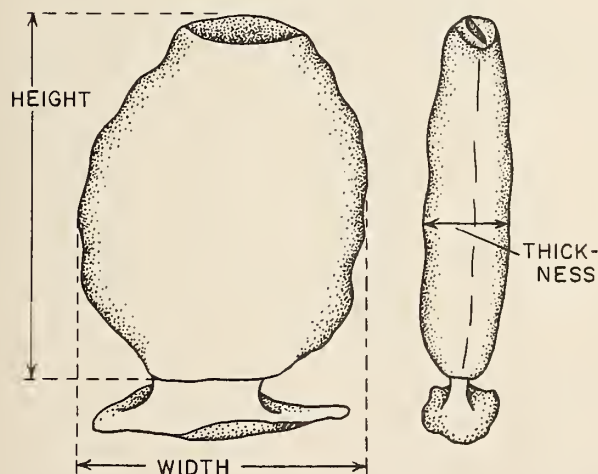
HS ==height of spire from the junction of the aperture to the apex

AA ==apical angle, formed between the shoulder, apex and the opposite shoulder

The approximate average height of a species is: minimum height plus maximum height divided by 2.

#### ACKNOWLEDGMENTS

I wish to express my appreciation and gratitude to Dr. A. Kohn for the helpful suggestions and information he supplied to me. I am indebted to Dr. Wright Barker for his patient compilation of reference material and photographs of type-figures of various *Conus* species, and to Dr. D. McMichael from the Australian Museum for pertinent references. My thanks are due to Dr. R. Stohler for his encouragement and tireless assistance, and Mr. A. Jennings for information supplied on the ecology and animals of various species and the loan of study material. I would like to thank Messrs. I. Morse, J. Farkas, G. Broesel and Mr. and Mrs. W. J. Erich for the loan of their Fijian study material, and the British Museum (Natural History) for permission to reproduce the colour photograph of Reeve's holotype of *Conus emaciatatus*, which was taken and kindly made available by Dr. Kohn.



Text figure 3: Generalized view of egg capsule of *Conus* (approximately  $\times 4.0$ ).





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Genus *Conus* LINNAEUS, 1758

Type species: *Conus marmoreus* LINNAEUS, 1758 - by subsequent designation CHILDREN, 1823 (Quart. Journ. Sci. Lit. Arts, 16: 69).

Characteristics: Shell conical, turbinated and multispiral, columella smooth, aperture long and narrow, outer lip thin; periostracum thick or thin, smooth or ridged, covering entire shell with exception of aperture; operculum small, narrow, pointed and corneous.

## DESCRIPTION OF SPECIES

1. *Conus acutangulus* LAMARCK, 1810

(Plate 17, Figure 54)

1810. *Conus acutangulus* LAMARCK, Ann. Mus. Hist. Nat., 15: 286
1857. *Conus acutangulatus* SOWERBY, Thes. Conch. 3: 11, pl. 16, fig. 356
1866. *Conus turriculatus* SOWERBY, Thes. Conch. 3: 328, pl. 27, figs. 643, 644 (non *C. turriculatus* DES-HAYES, 1865)
1870. *Conus gemmulatus* SOWERBY, Proc. Zool. Soc. London, p. 257, pl. 22, fig. 8
1911. *Conus acutanculus*, FRIEDBERG, Rozp. Wiadom. Muzeum Imien. Dzied. (Moll. Mioc. Poloniae), 14: 47

Shell: Shell small and fragile. Body whorl fawn to yellowish brown, with an irregular pattern of reddish-brown bands and lines, often arranged to form longitudinal streaks, leaving a light central transverse band; spiral ridges encircle the body whorl, and intervening grooves show a punctured pattern. Shoulder angulate, distinctly nodulose, spire high in proportion to shell length, concave, flecked with brown; whorls nodulose, striate, area between the spiral ridges and the upper whorl obliquely cancellate. Aperture narrow, lip thin and recurved, interior white or pale fawn.

Periostracum thin, smooth, translucent orange. The animal's foot is medium brown.

Type locality: Mers des grandes Indes.

H: 18 to 32 mm; W: 44 to 50%; HS: 26 to 36%; AA: 55° to 75°.

Habitat: From 2 to 15 fathoms, in sand. Rare.

Distribution: Mamanuca Group, West Viti Levu - Philippines, Hawaii.

Discussion: *Conus eugrammatus* BARTSCH & REHDER, 1943, was treated as a junior synonym by KOHN (1959, p. 372). KOHN & WEAVER (1962) gave a detailed comparison of both species, convincingly demonstrating their valid specific separation.

2. *Conus ammiralis* LINNAEUS, 1758

(Plate 13, Figure 24)

1758. *Conus ammiralis* LINNAEUS, Syst. Nat., ed. 10, p. 713, no. 257
1767. *Conus vicarius* LINNAEUS, Syst. Nat. ed. 12, p. 1167, no. 299
1798. *Cucullus imperialis* RÖDING, Mus. Bolten., p. 45 (non *Conus imperialis* LINNAEUS, 1758)
1847. *Conus admiralis* [sic], BERGE, Conchylienbuch, p. 234, pl. 40, fig. 12
1930. *Leptoconus ammiralis temnes* IREDALE, Mem. Qld. Mus. 10 (1): 80

Shell: Shell of medium size, solid and smooth. Body whorl reddish-brown to dark brown, with 3 to 5 moderately narrow, orange transverse bands; white trigonal maculations of varying sizes are scattered on the remaining area of the body whorl, intruding at times into the transverse bands. Shoulder angulate, smooth, spire concavely depressed, smooth, apex pointed. Aperture moderately wide, white within.

Periostracum orange-brown, moderately thick and opaque.



**Type locality:** Oc. Americae meridionalis [error].

H: 34 to 71 mm; W: 46 to 57%; HS: 14 to 18%; AA: 95° to 115°

**Habitat:** In patches of sand, shallow water. Rare.

**Distribution:** Throughout Fiji. - Indo-West Pacific.

**Discussion:** The species is extremely variable in pattern, and accordingly received a number of varietal names. *Conus vicarius* LINNAEUS had been placed in the synonymy of *C. ammiralis*; LINNAEUS' reference to ARGENVILLE's figure V, reproduced in KOHN (1963 b), leaves no doubt that it is one of the many individual or ecological forms of *C. ammiralis*.

3. *Conus arenatus* HWASS in BRUGUIÈRE, 1792

(Plate 14, Figure 27)

1792. *Conus arenatus* HWASS in BRUGUIÈRE, Encycl. Méth. Vers, 1: 621

1798. *Cucullus arenosus* RÖDING, Mus. Bolten., p. 40

1859. *Conus arenarius* BRUGUIÈRE, HANLEY, Journ. Proc. Linn. Soc. Zool., 4: 62

1891. *Conus armatus* SMITH, Proc. Zool. Soc. London, p. 402

1937. *Conus arenatus* var. *aequipunctata* DAUTZENBERG, Mém. Mus. Roy. Hist. Nat. Belg., 2 (18): pl. 1, fig. 2

1937. *Conus arenatus* var. *undata* DAUTZENBERG, Mém. Mus. Roy. Hist. Nat. Belg., 2 (18): pl. 1, fig. 3

1937. *Conus arenatus* var. *granulosa* HWASS, DAUTZENBERG, Mém. Mus. Roy. Hist. Nat. Belg., 2 (18): pl. 1, fig. 4

**Shell:** Shell solid and broad. Body whorl white or cream, ornamented with numerous small brown spots, arranged in such a manner as to form irregular blotches and two to three transverse bands; base striate, striae often granulose. Shoulder rounded, coronate, spire low and slightly concave or straight, whorls striate. Aperture slightly ventricose, widening basally, interior white.

**Type locality:** Philippines.

H: 25 to 60 mm; W: 55 to 64%; HS: 10 to 14%; AA: 105° to 125°

**Habitat:** In sand, in shallow water. Common.

**Distribution:** Throughout Fiji. - Indo-West Pacific.

**Discussion:** Coronations are often obsolete in large adult specimens, and occasionally shells are found which are granulose from base to shoulder.

4. *Conus aristophanes* SOWERBY, 1857

(Plate 18, Figure 67)

1857. *Conus aristophanes* SOWERBY, Thes. Conch., 3: 9, pl. 4, figs. 81, 82

**Shell:** Shell small, solid. Body whorl grey to greenish-grey, ornamented with two bluish-white transverse bands at shoulder and middle of whorl; about 12 to 15 rows of white and brown short dashes encircle the body whorl and the basal ridges are pronounced and continuous. The pattern of the last whorl is interrupted by a few whitish longitudinal zigzag lines. Shoulder coronate, often obsoletely nodulose in large mature specimens, with intervening spaces flecked dark brown; spire moderately low, nodulose, straight, often eroded. Each whorl bears one to two distinct spiral ridges. Aperture slightly narrow, fairly parallel to body whorl, margin of interior of aperture whitish, remainder violet-grey with a light median band.

Periostracum thin, smooth, translucent yellow.

**Type locality:** Philippines and Sandwich Islands [latter locality incorrect].

H: 15 to 37 mm; W: 60 to 67%; HS: 12 to 18%; AA: 105° to 125°

**Habitat:** Under dead coral on sandy substrate, and in sand patches, in shallow water. Common.

**Distribution:** Throughout Fiji. - Pacific.

**Discussion:** The species is usually associated with *Conus coronatus* GMELIN, 1791, but it is clearly separable as a species. The table below shows the more important morphological characteristics of the two species.

	<i>Conus coronatus</i>	<i>Conus aristophanes</i>
Shape:	ventricose, greatest width below shoulder	conical, greatest width at shoulder
Aperture:	flaring, wide and ventricose	slightly narrow, fairly parallel to body whorl
Spire:	elevated	rather depressed
Pattern:	brown to blackish-brown blotches on body whorl	blotches absent, light-coloured bands at shoulder and center
Coronations:	sharply cut, rarely obsolete	nodulose, often obsolete
Spiral ridges between whorls:	5 to 7 fine and well defined	1 to 2 broad, coarse
Basal ridges:	strong and interrupted	strong and continuous

5. *Conus aulicus* LINNAEUS, 1758

(Plate 13, Figure 18)

1758. *Conus aulicus* LINNAEUS, Syst. Nat. ed 10, p. 717, no. 279  
 1792. *Conus auratus* HWASS in BRUGUIÈRE, Encycl. Méth. Vers, 1: 740  
 1798. *Cucullus aureus* RÖDING, Mus. Bolten., p. 49 (non *Conus aureus* HWASS in BRUGUIÈRE, 1792)  
 1834. *Conus roseus* SOWERBY, Conch. Illust., pt. 55, fig. 71 (non *Conus roseus* FISCHER, 1807, non *Conus roseus* LAMARCK, 1810)

**Shell:** Shell large, elongate, solid. Body whorl brown to dark reddish-brown, ornamented with white trigonal maculations of varying sizes, arranged obliquely to the body whorl; the white pattern tends to form transverse zones at the shoulder, center and base. Spiral striae are distinct at the base, becoming obsolete towards the shoulder. Shoulder rounded, smooth, spire elevated, fairly straight, maculated with brown; whorls striate. Aperture wide, flaring basally, interior yellowish-pink or pale orange.

**Periostracum** thin, smooth, translucent orange.

**Type locality:** Asia.

**H:** 73 to 144 mm; **W:** 35 to 42%; **HS:** 12 to 17%  
**AA:** 70° to 90°

**Habitat:** Under dead coral on sandy substrate, in deeper water, occasionally in shallow water.

**Distribution:** Throughout Fiji. - Indo-West Pacific.

**Discussion:** The species has a venomous bite and should be handled with care; KOHN (1963) reported one case of poisonous sting, but it did not prove fatal.

6. *Conus aureus* HWASS in BRUGUIÈRE, 1792

(Plate 13, Figure 22)

1792. *Conus aureus* HWASS in BRUGUIÈRE, Encycl. Méth. Vers, 1: 742

**Shell:** Shell elongate-cylindrical. Body whorl orange to dark rusty brown, ornamented with numerous small and fine triangular white spots, arranged to form three transverse bands, and two or three longitudinal bands; the exposed orange or reddish-brown areas are marked with

blackish-brown wavy longitudinal streaks. Fine transverse striae encircle the body whorl from base to shoulder. Shoulder rounded, smooth, spire elevated, slightly concave to straight, maculated with orange and white, and axially curved dark orange lines; apex pointed and white, whorls obsoletely striate. Aperture narrow, white within.

**Type locality:** China.

**H:** 25 to 62 mm; **W:** 38 to 44%; **HS:** 15 to 21%;  
**AA:** 80° to 90°

**Habitat:** Under dead coral on sandy substrate, in shallow and deeper water.

**Distribution:** North and South Viti Levu. - Pacific.

7. *Conus balteatus* SOWERBY, 1833

(Plate 16, Figure 49)

1833. *Conus balteatus* SOWERBY, Conch. Illust., pt. 37, fig. 58  
 1849. *Conus primula* REEVE, Conch. Icon., Supplement, pl. 6, spec. 259

**Shell:** Shell small. Body whorl brown, ornamented with small bluish-white spots and one or two pale transverse bands at the shoulder and center; the shoulder band is occasionally absent in large adult specimens. The last whorl spirally striate, striae pronounced basally, becoming flatter and wider spaced towards the shoulder. Shoulder angulate, coronate, intervening space stained with pale lilac or pale brown; spire low to moderately elevated, straight, coronate, bluish-white. Whorls bear 6 to 8 fine spiral striae. Aperture narrow, parallel to body whorl, interior violet with a pale band near shoulder and center.

**Periostracum** pale brown, smooth, moderately thick. In juvenile specimens the shoulder band is pronounced and interrupted by longitudinal brown streaks.

**Type locality:** None.

**H:** 23 to 38 mm; **W:** 58 to 63 %; **HS:** 9 to 16%;  
**AA:** 110° to 145°

**Habitat:** Under dead coral in shallow water. Uncommon.

**Distribution:** Throughout Fiji. - Indo-West Pacific.

**Discussion:** *Conus propinquus* SMITH, 1877 appears to be closely related to *C. balteatus*; it differs from the latter by being generally smaller in size, with only 5 to 6 spiral

## Explanation of Plate 12

- Figure 1: *Conus leopardus* RÖDING. Fiji (x 0.3)  
 Figure 2: *Conus litteratus* LINNAEUS. Fiji (x 0.45)  
 Figure 3: *Conus eburneus* HWASS. Fiji (x 1.0)  
 Figure 4: *Conus distans* HWASS. Fiji (x 0.45)  
 Figure 5: *Conus vexillum* GMELIN. Fiji (x 0.5)  
 Figure 6: *Conus radiatus* GMELIN. Fiji (x 0.7)  
 Figure 7: *Conus miles* LINNAEUS. Fiji (x 0.7)  
 Figure 8: *Conus generalis* LINNAEUS. Fiji (x 0.7)

- Figure 9: *Conus marmoreus* LINNAEUS. Fiji (x 0.5)  
 Figure 10: *Conus bandanus* HWASS. Fiji (x 0.5)  
 Figure 11: *Conus imperialis* LINNAEUS. Fiji (x 0.5)  
 Figure 12: *Conus striatus* LINNAEUS. Fiji (x 0.6)  
 Figure 13: *Conus terebra* BORN. Fiji (x 0.6)  
 Figure 13a: *Conus terebra* BORN, juvenile specimen. Fiji (x 1.5)  
 Figure 14: *Conus figulinus* LINNAEUS. Fiji (x 0.6)



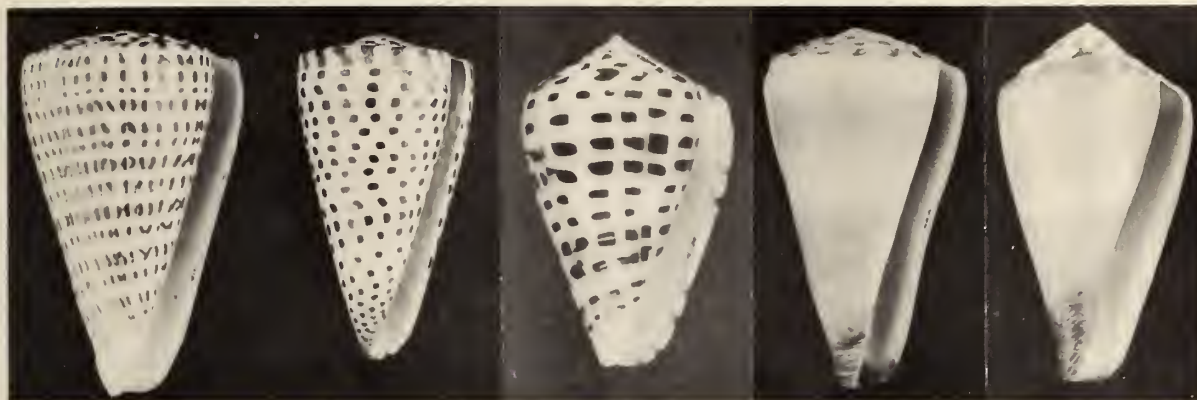


Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

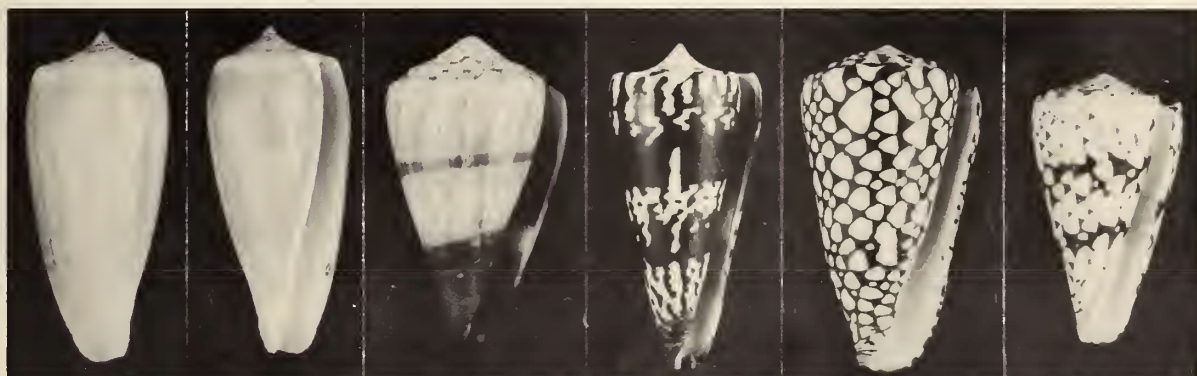


Figure 6

Figure 7

Figure 8

Figure 9

Figure 10



Figure 11

Figure 12

Figure 13

Figure 13 a

Figure 14





striae between whorls, having more rounded and wider spaced coronations on the shoulder, numbering 10 on the average, in comparison to 13 in *C. balteatus*. The basal extremity and a small area immediately above it are bluish white in *C. propinquus*, but constantly brown in *C. balteatus*.

8. *Conus bandanus* HWASS in BRUGUIÈRE, 1792

(Plate 12, Figure 10)

1792. *Conus bandanus* HWASS in BRUGUIÈRE, Encycl. Méth. Vers, 1: 611

**Shell:** The species closely resembles *Conus marmoreus* LINNAEUS, 1758, in shape, sculpture and general pattern; it differs in that the white triangular markings are smaller and more numerous, and are arranged in such a fashion as to form two distinct black narrow transverse bands on the body whorl. The triangular white markings are bordered with orange-brown, a feature absent in *C. marmoreus*.

**Periostracum** smooth, yellowish-brown, moderately translucent.

**Type locality:** Banda Island (Moluccas).

**H:** 46 to 88 mm; **W:** 52 to 59%; **HS:** 9 to 18%; **AA:** 120° to 140°

**Habitat:** On sandy substrate in deeper water. Rare.

**Distribution:** Mamanuca group, West Viti Levu. - Indo-West Pacific.

**Discussion:** TOMLIN (1937) and KIRA (1959) list *Conus bandanus* as a good species, while other writers regard it to be a form of *C. marmoreus*. The two species are clearly separable in Fiji, and intermediate specimens are not known. *Conus bandanus* has never been collected in shallow water in Fiji, whereas *C. marmoreus* is a common intertidal species.

9. *Conus bullatus* LINNAEUS, 1758

(Plate 13, Figure 21)

1758. *Conus bullatus* LINNAEUS, Syst. Nat., ed. 10, p. 717, no. 281

1798. *Cucullus parvus* RÖDING, Mus. Bolten., p. 46

1798. *Cucullus laganum* RÖDING, Mus. Bolten., p. 51

**Shell:** Shell cylindrically-ovate, rather solid. Body whorl white or bluish-white, ornamented with orange-brown or reddish-brown irregular, somewhat subtrigonal splotches; the reddish-brown markings tend to merge and form 2 to 3 ill-defined, broad transverse bands. The white or bluish-white base colour is exposed in the form of nebulous subtrigonal spots; the base bears widely spaced punctured grooves, while the remaining area of the body whorl appears glossy and smooth. Under close scrutiny, extremely fine and close-set spiral striae are discernible,

and these extend as far as the shoulder; the maximum width of the shell is about one third of the length below the shoulder. Shoulder rounded, smooth. spire very low, concave, alternately flecked with pink and reddish-brown; whorls canaliculate, striate and axially cancellate. Aperture wide, flaring basally, interior orange with a broad pink marginal area.

**Type locality:** None.

**H:** 45 to 66 mm; **W:** 46 to 53%; **HS:** 5 to 10%; **AA:** 115° to 130°

**Habitat:** Deep water, on sandy substrate. Very rare.

**Distribution:** Known only from Yanuca Island, South Viti Levu. - Pacific.

10. *Conus capitaneus* LINNAEUS, 1758

(Plate 14, Figure 30)

1758. *Conus capitaneus* LINNAEUS, Syst. Nat., ed. 10, p. 713, no. 254

1792. *Conus classarius* HWASS in BRUGUIÈRE, Enc. Méth. Vers, 1: 705

1817. *Conus chemnitzii* DILLWYN, Desc. cat. rec. shells, 1: 363

1845 [?] *Conus blainvillei* KIENER, Spéc. Gén. Icon. Coq. Viv., p. 358, pl. 111, fig. 1

1858. *Conus ceciliae* CROSSE, Journ. Conchyl., 7: 381, pl. 14, fig. 5

**Shell:** Shell of medium size, fairly broad. Body whorl yellowish-brown to dark olive-brown, with two white transverse bands at shoulder and center; the central band is ornamented with dark brown blotches, while the shoulder band is longitudinally streaked with the same colour, and the streaks extend onto the spire. Interrupted dark brown lines encircle the body whorl, but may be absent in some specimens; spiral striae appear as widely separated ridges basally, and intervening striae show a punctured pattern. The base is stained with violet-brown. Shoulder angulate, broad and smooth, spire low, slightly concave, flecked with dark brown and white; whorls spirally striate. Aperture wide, angular at shoulder, interior violet.

**Periostracum** brown, transversely ridged, moderately thick.

**Type locality:** Asia.

**H:** 30 to 63 mm; **W:** 62 to 72%; **HS:** 5 to 11%; **AA:** 125° to 150°

**Habitat:** Under dead coral, in shallow and deeper water. Uncommon.

**Distribution:** Throughout Fiji. - Indo-West Pacific.

**Discussion:** The angular and very broad shoulder, the great width in relation to shell length, and the dark brown blotches in the central band, readily separate this species from *Conus mustelinus* HWASS in BRUGUIÈRE, 1792.

11. *Conus catus* HWASS in BRUGUIÈRE, 1792  
(Plate 15, Figure 42)

1792. *Conus catus* HWASS in BRUGUIÈRE, Encycl. Méth. Vers, 1: 707  
1798. *Cucullus nubilus* RÖDING, Mus. Bolten., p. 46  
1833. *Conus discrepans* SOWERBY, Conch. Illust., pt. 29, fig. 28  
1862. *Conus purus* PEASE, Proc. Zool. Soc. London, p. 279 (Niuhau Island)  
1937. *Conus catus* var. *rubrapapillosa* DAUTZENBERG, Mém. Mus. Roy. Hist. Nat. Belg., 2 (18); pl. 1, fig. 7  
1937. *Conus catus* var. *fuscolivaceus* DAUTZENBERG, Mém. Mus. Roy. Hist. Nat. Belg., 2 (18); pl. 1, fig. 8

Shell: Shell small, bulbous and solid. Body whorl either dark brown, maculated with irregular white blotches, or white and ornamented with dark brown or reddish-brown blotches and spots; occasional specimens bear interrupted brown transverse lines on the body whorl. Spiral striae ridged and granulose basally, usually becoming obsolete towards the shoulder, although some specimens are granulose all over. Shoulder rounded, smooth, spire straight to convex, apex nipple-like if not eroded; whorls distinctly striate. Aperture moderately wide, interior white with a brown marginal edge.

Periostracum thin, smooth, translucent yellowish-brown.

Type locality: St. Domingue, Martinique, Île de France (Mauritius) [The first two localities are most probably erroneous.]

H: 20 to 50 mm; W: 55 to 65%; HS: 12 to 23%; AA: 85° to 115°

Habitat: Under dead coral on sand or reef substrate, in shallow water. Uncommon.

Distribution: West and South Viti Levu. - Indo-West Pacific.

Discussion: The species is piscivorous in nature (KOHN, 1963).

12. *Conus chaldaeus* (RÖDING, 1798)  
(Plate 18, Figure 70)

1798. *Cucullus chaldaeus* RÖDING, Mus. Bolten., p. 42  
1810. *Conus vermiculatus* LAMARCK, Ann. Mus. Hist. Nat., Paris, 15: 34

Shell: The species resembles *Conus ebraeus* LINNAEUS, 1758; apart from being generally slightly smaller in size, *C. chaldaeus* has such close-set longitudinal flammules, that the white or ivory base colour appears in the form of longitudinal wavy white lines and two narrow transverse bands at the shoulder and center.

Periostracum thin, smooth and translucent yellow.

Type locality: None. ("Seas of Asia," LAMARCK, 1810)  
H: 18 to 41 mm; W: 55 to 66%; HS: 18 to 25%; AA: 100° to 120°

Habitat: In crevices of coral benches, close to the shore. Rare.

Distribution: Throughout Fiji. - Indo-Pacific to Clipper-ton and Galápagos Islands.

Discussion: The name of this species is frequently misspelled *Conus chaldeus* in literature. Fiji specimens of *C. chaldaeus* and *C. ebraeus* appear consistently different, and intermediate specimens have not been recorded.

13. *Conus circumactus* IREDALE, 1929  
(Plate 14, Figure 33)

1822. *Conus cinctus* SWAINSON, Zool. Illust., ser. 1 (2), pl. 110 [non *Conus cinctus* BOSCH, 1801, non *C. cinctus* LINK, 1807]  
1822. *Conus pulchellus* SWAINSON, Zool. Illust., ser. 1 (2), pl. 114 [non *Cucullus pulchellus* RÖDING, 1798]  
1929. *Conus circumactus* IREDALE, Mem. Qld. Mus., 9: 281 [nom. nov. pro *Conus cinctus* SWAINSON, 1822]  
1943. *Conus hammatus* BARTSCH & REHDER, Proc. Biol. Soc. Washington 56: 86  
1959. *Conus circumactis* IREDALE, KOHN, Pacif. Sci., 13: 377 [incorrect subsequent spelling]

Explanation of Plate 13

Figure 15: *Conus quercinus* SOLANDER. Fiji (x 0.6)

Figure 16: *Conus virgo* LINNAEUS. Fiji (x 0.5)

Figure 17: *Conus emaciatus* REEVE. Fiji (x 0.8)

Figure 17a: holotype of *Conus emaciatus* REEVE (38mm

x 20mm) from the British Museum (Natural History).

Re-photographed from original colour photograph taken

by Dr. A. Kohn.

Figure 18: *Conus aulicus* LINNAEUS. Fiji (x 0.4)

Figure 26: *Conus tessulatus* BORN. Fiji (x 1.0)

Figure 19: *Conus omaria* HWASS. Fiji (x 0.75)

Figure 20: *Conus episcopus* HWASS. Fiji (x 0.8)

Figure 21: *Conus bullatus* LINNAEUS. Yanuca Island, Fiji (x 0.75)

Figure 22: *Conus aureus* HWASS. Fiji (x 0.70)

Figure 23: *Conus textile* LINNAEUS. Fiji (x 0.65)

Figure 24: *Conus ammiralis* LINNAEUS. Fiji (x 0.75)

Figure 25: *Conus retifer* MENKE. Fiji (x 0.7)



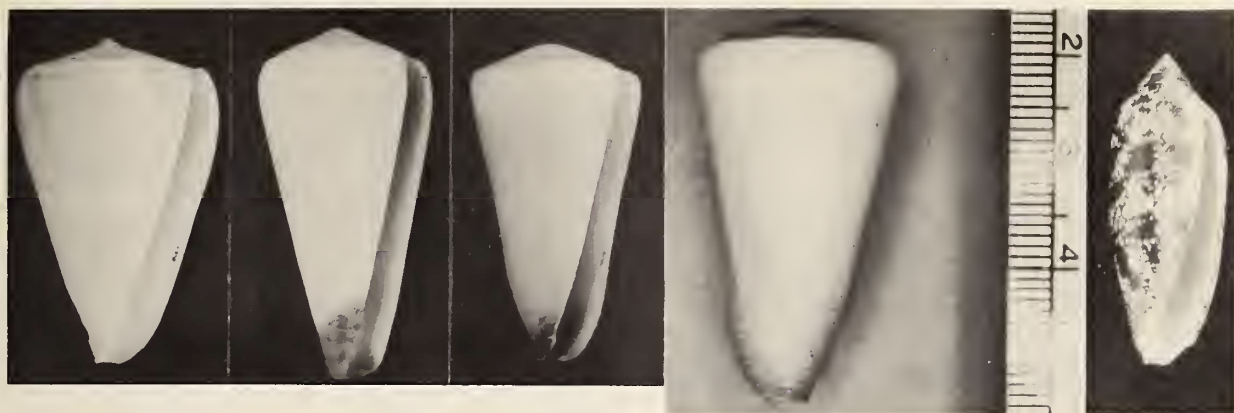


Figure 15

Figure 16

Figure 17

Figure 17 a

Figure 18



Figure 19

Figure 20

Figure 21

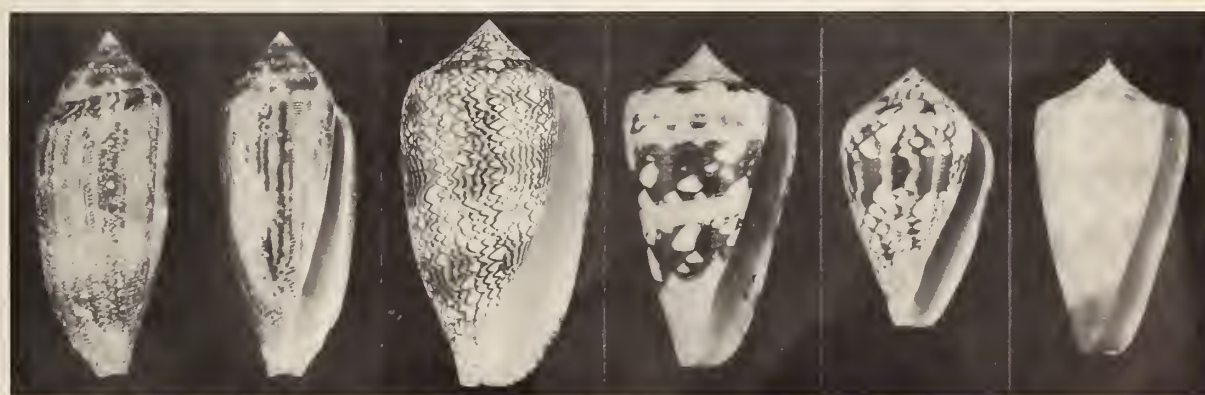


Figure 22

Figure 23

Figure 24

Figure 25

Figure 26



**Shell:** Shell of medium size, fairly solid. Body whorl yellow or orange-brown, with large white blotches arranged in bands at the shoulder and centrally on body whorl; thin brown lines, often interrupted, encircle the shell. Base and lower part of aperture stained with pink, occasionally violet-pink; body whorl transversely striate, spiral ridges basally granulose, becoming obsolete towards the shoulder. Shoulder sharply angled, smooth, spire low, whitish or pink and flecked with brown; whorls striate. Aperture narrow, fairly parallel to body whorl, interior pinkish-white.

**Type locality:** Amboina.

H: 15 to 55 mm; W: 50 to 57%; HS: 9 to 16%; AA: 105° to 130°

**Habitat:** On sand substrate in deeper water, occasionally in shallow water. Rare.

**Distribution:** North and East Viti Levu. - Pacific.

**Discussion:** The holotype of *Conus hammatulus* BARTSCH & REHDER is a juvenile specimen of *C. circumactus* (fide KOHN, 1959). TOMLIN (1937) stated that the holotype of *C. connectens* A. ADAMS, 1855, is identical with *C. circumactus*. Should TOMLIN's assumption prove to be correct, *C. connectens* A. ADAMS would have priority over *C. circumactus* IREDALE. ADAM's type specimen appears to be a large (54 mm), beach-worn, faded creamy-yellow shell with faint remnants of two broad reddish-orange transverse bands. I hesitate to associate this shell with *C. circumactus*.

14. *Conus coronatus* GMELIN, 1791

(Plate 18, Figure 68)

1778. *Conus minimus* BORN, Test. Mus. Caes. Vindob., p. 156 [non *Conus minimus* LINNAEUS, 1758]

1791. *Conus coronatus* GMELIN, Syst. Nat., ed. 13, p. 3389

1798. *Cucullus coronalis* RÖDING, Mus. Bolten., p. 38

1864. *Conus minimus* var. *condoriana* CROSSE & FISCHER, Journ. Conchyl., 12: 334

**Shell:** Shell small, bulbous, and solid. Body whorl white, fawn or pale brown, with brown or blackish-brown blotches of various sizes and white irregular streaks; transverse rows of small brown dots and spiral striae encircle the body whorl; striae at base and part of the whorl raised and distinctly granulose. Shoulder coronate, spire elevated, nodulose, flecked with brown; whorls bear 5 to 7 fine, well defined spiral striae. The maximum width of the shell is reached below the shoulder. Aperture wide and bulbous, interior purplish-grey with a whitish median band and marginal edge.

Periostracum thin, smooth, translucent pale orange.

**Type locality:** None. ("In Indiis," BORN, 1778).

H: 15 to 33 mm; W: 60 to 67%; HS: 16 to 24%; AA: 80° to 110°

**Habitat:** Under coral on sand substrate and sand pockets, in shallow water. Common.

**Distribution:** Throughout Fiji. - Indo-West Pacific.

15. *Conus cylindraceus* BRODERIP & SOWERBY, 1830

(Plate 17, Figure 58)

1830. *Conus cylindraceus* BRODERIP & SOWERBY, Zool. Journ. London, 5: 51, Suppl. pl. 40, fig. 5

**Shell:** Shell narrow and cylindrical. Body whorl greyish-brown to reddish-brown, ornamented with longitudinal curved white lines extending from shoulder to base; white short streaks and dots are placed between these lines, and form an interrupted band at the shoulder and another one third above the base. Spiral striae are granulose at the base, becoming obsolete towards the shoulder. Shoulder hardly formed, smooth, spire extremely elevated and convex; each whorl bears a distinct spiral groove. Aperture narrow, parallel to body whorl, interior white.

**Type locality:** None.

H: 20 to 30 mm; W: 32 to 40%; HS: 28 to 34%; AA: 40° to 55°

**Habitat:** Dredged from deeper water. Very rare.

**Distribution:** West Viti Levu. - Pacific.

16. *Conus dilectus* GOULD, 1850

(Plate 17, Figure 62)

1850. *Conus dilectus* GOULD, Proc. Boston Soc. Nat. Hist., 3: 172, Exped. shells, fig. 367

**Shell:** Shell very small, narrow and conical. Body whorl pale red to reddish-brown, irregularly spotted with white to form one faint band arrangement below the shoulder, and another central transverse band composed of irregular white longitudinal wavy blotches. Base spirally ridged, striae becoming obsolete towards the shoulder; minute brown spots are situated on top of the spiral ridges. Shoulder angulate, obsoletely coronate, spire elevated, straight to slightly concave, nodulose, apex pointed; early whorls pale orange, last two whorls whitish, maculated with rather triangular blackish-brown blotches. Each whorl bears two distinct spiral ridges. Aperture narrow, straight, interior delicate rose colour.

Periostracum thin, smooth, translucent yellow.

**Type locality:** Feejee Islands (Fiji Islands).

H: 11 to 13 mm; W: 48 to 51%; HS: 18 to 22%; AA: 85° to 95°

**Habitat:** In sand patches of coral reefs, in shallow and deep water. Very rare.

**Distribution:** Restricted to North Viti Levu.

**Discussion:** GOULD's description, type figure and size



quoted for the type specimen (Long:  $\frac{1}{2}$ ", Lat:  $\frac{1}{4}$ ") agree well with Fiji specimens.

17. *Conus distans* HWASS in BRUGUIÈRE, 1792  
(Plate 12, Figure 4)

1792. *Conus distans* HWASS in BRUGUIÈRE, Encycl. Méth. Vers, 1: 634

**Shell:** Shell large and thick. Body whorl pale yellowish-brown or fawn, smooth, with two whitish transverse bands at the shoulder and center; base stained purplish-brown. Shoulder angulate, coronate, coronations white, intervening spaces stained dark brown; spire low, tuberculate. Aperture narrow, slightly waisted, fairly parallel to body whorl; interior pale violet, stained dark violet basally.

Periostracum greenish-brown, thick, ridged and tufted.

**Type locality:** Coast of New Zealand [error].

H: 51 to 90 mm; W: 52 to 59%; HS: 7 to 15%; AA: 125° to 145°

**Habitat:** In patches of sand, among weed, in shallow and deeper water. Uncommon in the South, rare in North Viti Levu.

**Distribution:** West, South and North Viti Levu. - Indo-West Pacific.

18. *Conus ebraeus* LINNAEUS, 1758  
(Plate 18, Figure 69)

1758. *Conus ebraeus* LINNAEUS, Syst. Nat., ed. 10, p. 715, no. 268

1778. *Conus hebraeus* BORN, Test. Mus. Caes. Vindob., p. 159

1811. *Conus quadratus* PERRY, Conchology, pl. 24, fig. 5 [non *Cucullus quadratus* RÖDING, 1798]

**Shell:** Shell conical and solid. Body whorl white or cream, ornamented with blackish-brown, trapezoidal blotches, arranged longitudinally to form 3 to 4 transverse, interrupted bands; base spirally ridged, often granulose. Shoulder angulate, coronate, spire moderately elevated, subcoronate, symmetrically flecked with blackish-brown and white; whorls finely striate. Aperture narrow, interior violet-brown, with a light median band.

Periostracum thin, smooth, translucent yellow.

**Type locality:** India.

H: 16 to 45 mm; W: 57 to 62%; HS: 15 to 21%; AA: 100° to 125°

**Habitat:** In crevices of coral benches close to shore. Common.

**Distribution:** Throughout Fiji. - Indo-West Pacific to Clipperton and Galápagos Islands.

**Discussion:** The species is frequently misspelled *Conus hebraeus* in literature.

19. *Conus eburneus* HWASS in BRUGUIÈRE, 1792  
(Plate 12, Figure 3)

1792. *Conus eburneus* HWASS in BRUGUIÈRE, Encycl. Méth. Vers, 1: 640

1858. *Conus crassus* SOWERBY, Thes. Conch., 3: 25, figs. 254, 255 (Hab: Fiji Islds.)

**Shell:** Shell conical and solid. Body whorl white, ornamented with transverse rows of blackish-brown bars and rectangular blotches; two to four yellow or orange, narrow transverse bands encircle the body whorl, but are occasionally absent. Base spirally striate. Shoulder angulate, smooth, spire elevated or almost flat, concave, white flecked with blackish-brown; whorls bear two spiral striae. Aperture narrow, fairly straight, interior white.

Periostracum smooth, orange-brown and opaque in adults, yellowish-orange and translucent in juvenile specimens.

**Type locality:** East Indies.

H: 12 to 62 mm; W: 62 to 67%; HS: 5 to 14%; AA: 110° to 160°

**Habitat:** Among weed, on sand substrate, in shallow water. Common.

**Distribution:** Throughout Fiji. - Indo-West Pacific.

**Discussion:** The species is extremely variable in respect to the height of the spire, density and arrangement of the blackish-brown bars and blotches, and the number of yellow transverse bands. *Conus crassus* SOWERBY appears to be an individual aberrant, sporadically occurring in large populations of *C. eburneus* in Fiji.

20. *Conus emaciatius* REEVE, 1849  
(Plate 13, Figures 17, 17 a)

1849. *Conus emaciatius* REEVE, Conch. Icon., Suppl., pl. 5, spec. 248

**Shell:** Shell slightly elongate. Body whorl orange or orange-yellow, with two pale yellow transverse bands at shoulder and mid-area; body whorl encircled by widely

### Explanation of Plate 14

Figure 27: *Conus arenatus* HWASS. Fiji (x 0.85)

Figure 28: *Conus pulicarius* HWASS. Fiji (x 0.7)

Figure 29: *Conus planorbis* BORN. Fiji (x 0.75)

Figure 29a: *Conus planorbis* BORN, yellow, granulose variant. Fiji (x 1.0)

Figure 35: *Conus varius* LINNAEUS. Fiji (x 0.65)

Figure 30: *Conus capitaneus* LINNAEUS. Fiji (x 0.75)

Figure 31: *Conus mustelinus* HWASS. Fiji (x 0.65)

Figure 32: *Conus vitulinus* HWASS. Fiji (x 0.85)

Figure 33: *Conus circumactus* IREDALE. Fiji (x 1.0)

Figure 34: *Conus striatellus* LINK. Fiji (x 1.0)

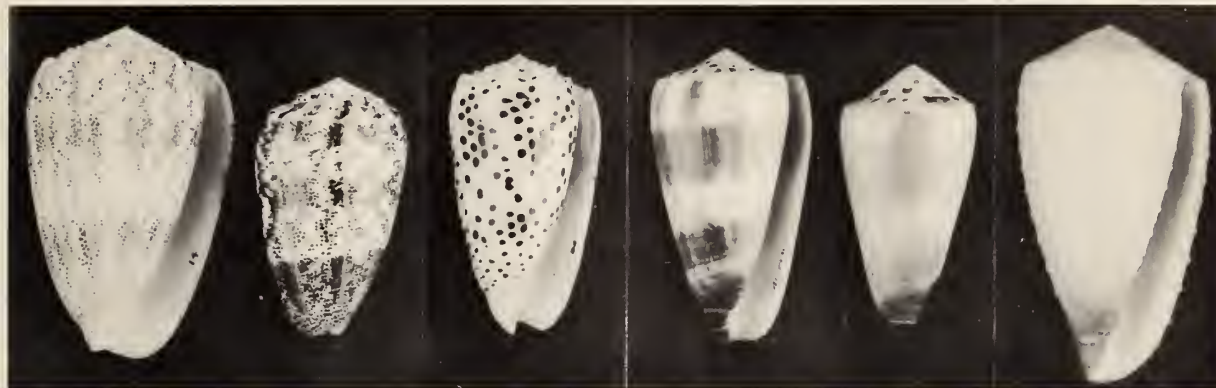


Figure 27

Figure 28

Figure 29

Figure 29 a



Figure 30

Figure 31

Figure 32

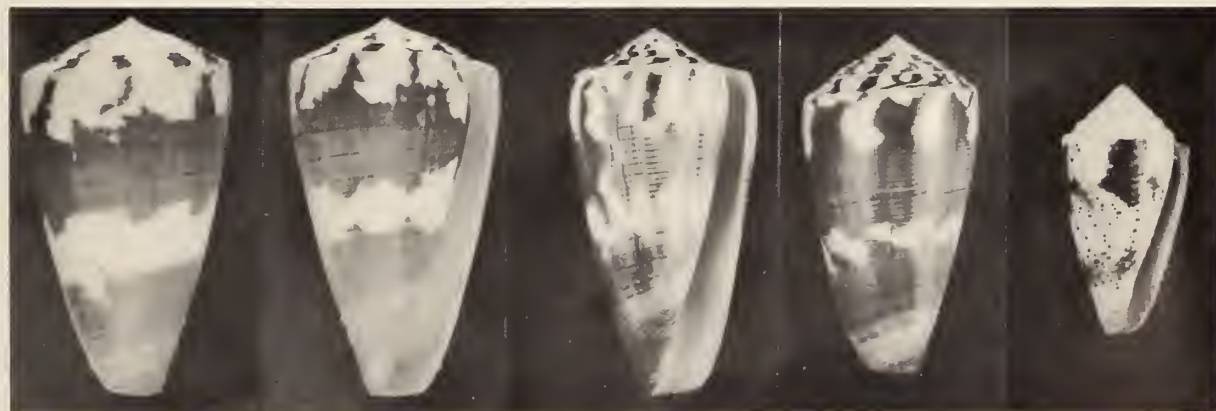


Figure 33

Figure 34

Figure 35





spaced spiral striae, which become obsolete at the shoulder. The left side of the shell is slightly concave towards the anterior end, and the base and anterior portion of aperture are stained with purple. Shoulder angulate, smooth, spire depressed, often flat and eroded, yellow in colour, becoming creamy-white towards the apex; whorls finely striate. Aperture narrow, waisted centrally, slightly broadening anteriorly; interior pinkish-white, with an orange marginal edge.

Periostracum dark brown, smooth and thick. Juvenile specimens are dark orange or orange-brown, have well defined and granulose spiral striae, and the interior of the aperture is violet.

Type locality: Philippine Islands.  
H: 24 to 56 mm; W: 50 to 61%; HS: 5 to 12%; AA: 120° to 170°  
Habitat: In crevices of coral boulders, on reef substrate, in shallow water. Common.

Distribution: Throughout Fiji. - Indo-West Pacific.

Discussion: TOMLIN (1937), COTTON (1945) and DODGE (1953) considered this species synonymous with *Conus virgo* LINNAEUS, 1758. TOMLIN (*l. c.*) stated that REEVE's holotype, preserved in the British Museum, was a *C. virgo*; a colour photograph of REEVE's type specimen, kindly made available to me by Dr. Kohn, shows REEVE's type to be a typical *C. emaciatus*. Specimens of both species with preserved animals, collected by the author in Fiji, were forwarded to Dr. Kohn for study of the soft parts. Dr. Kohn (personal communication) found the

radular teeth of *C. emaciatus* to resemble those of *C. flavidus* LAMARCK more closely than those of *C. virgo* or *C. frigidus* REEVE.

The more important morphological characteristics of both species are given in the table below.

21. *Conus episcopus* HWASS in BRUGUIÈRE, 1792  
(Plate 13, Figure 20)
1792. *Conus episcopus* HWASS in BRUGUIÈRE, *Encycl. Méth. Vers.*, 1: 748, var.  $\beta$
1937. *Conus episcopus* var. *elongata* DAUTZENBERG, *Mém. Mus. Roy. Hist. Nat. Belg.*, 2 (18), pl. 3, fig. 7

Shell: Shell elongate and narrow. Body whorl dark brown, ornamented with large white irregularly trigonal blotches, often arranged to form 3 ill-defined transverse and longitudinal bands; the brown areas are flecked with small white spots. The body whorl is finely transversely striate from base to shoulder. Shoulder rounded and sloping, smooth, spire straight to slightly concave, but short in relation to shell length, apex obtusely rounded; whorls smooth. Aperture narrow, interior white.

Periostracum thin, smooth, translucent yellowish-brown.

Type locality: Grandes Indes.  
H: 40 to 70 mm; W: 40 to 46%; HS: 10 to 16%; AA: 80° to 110°  
Habitat: Under coral on sand substrate, or buried in sand. Rare.

<i>Conus virgo</i>		<i>Conus emaciatus</i>
Length:	38 to 150 mm	24 to 56 mm
Width:	50% to 59%	50% to 61%
Body whorl in adults:	creamy-white, spiral striae distinct at base, but obsolete elsewhere, striae abruptly at aperture	orange, widely spaced spiral striae from base to just below shoulder, striae continue inside the aperture, body whorl with two light bands
Spire:	slightly elevated, concave first whorl channeled near shoulder, maximum width just below the shoulder	low, often flat and eroded, whorls finely striate, maximum width at shoulder
Juvenile specimens:	yellow to orange, spiral striae on body whorl close-set, obsolete inside of aperture	dark orange-brown, with pronounced spiral granulose ridges from base to shoulder
Lip of aperture:	straight, occasionally slightly waisted	distinctly waisted
Habitat:	in sand	in crevices and under coral

**Distribution:** West and South Viti Levu. - Indo-West Pacific.

22. *Conus figulinus* LINNAEUS, 1758  
(Plate 12, Figure 14)

1758. *Conus figulinus* LINNAEUS, Syst. Nat., ed. 10, p. 715, no. 267  
1798. *Cucullus buxeus* RÖDING, Mus. Bolten., p. 42  
1845. *Conus lorioisii* KIENER, Spéc. Gén. Icon. Coq. Viv., 2: 91, pl. 65, fig. 1  
1883. *Conus figulinus* var. *chytreus* TRYON, Man. Conch., 6: 17, pl. 27, fig. 1  
1933. *Conus figulinus* var. *violascens* BARROS & CUNHA, Mem. Estud. Mus. Zool. Univ. Coimbra, ser. 1, no. 71, p. 37  
1937. *Conus figulinus* var. *insignis* DAUTZENBERG, Mém. Mus. Roy. Hist. Nat. Belg., 2 (18), pl. 1, fig. 6 [non *C. insignis* SOWERBY, 1833]

**Shell:** Shell large, solid, pyriform. Body whorl light brown to dark tan in colour, ornamented with dark brown, continuous, close-set spiral lines; base spirally striate, striae becoming obsolete towards the shoulder. Shoulder rounded, smooth, spire depressed, convex; early whorls acuminate. Aperture straight, moderately narrow, interior white.

**Type locality:** None.

H: 42 to 97 mm; W: 56 to 65%; HS: 10 to 15%; AA: 110° to 130°

**Habitat:** Among weed, on sand substrate, in shallow and deeper water. Rare.

**Distribution:** West, South and East Viti Levu. - Indo-West Pacific.

23. *Conus flavidus* LAMARCK, 1810  
(Plate 16, Figure 48)

1810. *Conus flavidus* LAMARCK, Ann. Mus. Hist. Nat., Paris, 15: 265  
1860. *Conus neglectus* PEASE, Proc. Zool. Soc. London, pt. 28, p. 398 [non *C. neglectus* A. ADAMS, 1853]  
1877. *Lithoconus peasei* BRAZIER, Proc. Linn. Soc. New South Wales, 1: 288 [nom. nov. pro *Conus neglectus* PEASE, 1860]

**Shell:** Shell of medium size, thick. Body whorl orange-brown to reddish-brown, with two white or bluish-white transverse bands at the shoulder and center; base spirally ridged, ridges often granulose, becoming obsolete past the central band towards the shoulder. Base stained with dark violet. Shoulder angulate, smooth, spire low to moderately elevated, white or bluish-white, slightly canaliculate, but often eroded; whorls obsoletely striate. Aperture narrow, lip thin, interior dark violet with a pale median band, marginal edge orange.

Periostracum dark grey, smooth and thick in adults, transversely ridged and thinner in juvenile specimens.

Egg capsules are small and oval, ridged, pale pink in colour; capsules measured approximately 8.5 mm in height and 6.5 mm in maximum width; they were deposited on the substrate in parallel rows.

**Type locality:** None.

H: 28 to 61 mm; W: 54 to 63%; HS: 6 to 13%; AA: 115° to 150°

**Habitat:** Under dead coral, on reef substrate and in crevices of shelving coral reef benches, in shallow water. Common.

**Distribution:** Throughout Fiji. - Indo-West Pacific.

24. *Conus frigidus* REEVE, 1848  
(Plate 16, Figure 47)

1848. *Conus frigidus* REEVE, Conch. Icon., Suppl., pl. 3, spec. 284

**Shell:** Shell solid, thick. Body whorl fawn to yellowish-brown, with two pale fawn transverse bands at shoulder and center; base spirally striate, striae distinctly ridged and granulose at base, becoming less pronounced towards the shoulder. Base stained with violet. Shoulder slightly rounded, smooth, spire moderately elevated, straight, fawn in colour, often eroded; apex pale violet, whorls with 3 to 4 distinct spiral threads. Aperture narrow, lip thick, interior violet, with a pale median band, and occasionally a pale oval area on the lower half.

Periostracum dark greyish-brown, smooth, thick.

**Type locality:** None.

H: 30 to 50 mm; W: 57 to 64%; HS: 7 to 15%; AA: 110° to 130°

### Explanation of Plate 15

- Figure 36: *Conus scabriusculus* DILLWYN. Fiji (x 0.8)  
Figure 37: *Conus geographus* LINNAEUS. Fiji (x 0.45)  
Figure 38: *Conus tulipa* LINNAEUS. Fiji (x 0.7)  
Figure 39: *Conus spectrum* LINNAEUS. Fiji (x 1.0)  
Figure 40: *Conus obscurus* SOWERBY. Fiji (x 1.25)  
Figure 41: *Conus magus* LINNAEUS. Fiji (x 0.8)  
Figure 42: *Conus catus* HWASS. Fiji (x 0.9)

- Figure 43: *Conus achatinus* GMELIN. Darwin, North Australia (x 0.7)  
Figure 44: *Conus* cf. *C. vinctus* ADAMS. Fiji (x 1.25)  
Figure 44a: *Conus* cf. *C. vinctus* ADAMS. Sulu Sea, Philippine Islands (x 1.0)  
Figure 45: *Conus* species. Fiji (x 0.75)  
Figure 45a: *Conus* species, Batangas Bay, Luzon, Philippine Islands (x 0.7)





Figure 36

Figure 37

Figure 38

Figure 39



Figure 40

Figure 41

Figure 42

Figure 43



Figure 44

Figure 44 a

Figure 45

Figure 45 a





**Habitat:** Under dead coral, on reef substrate, in shallow water. Uncommon.

**Distribution:** West and South Viti Levu. - Indo-West Pacific.

**Discussion:** *Conus flavidus* LAMARCK, which is closely related to *C. frigidus*, usually lacks the spiral ridges on the upper part of the body whorl, and the transverse bands are white or bluish-white, not pale yellowish-fawn as in *C. frigidus*; the latter has a slightly rounded shoulder, distinctly striate whorls and a pale violet apex, features which distinguish it from *C. flavidus*. Dr. Kohn (personal communication) found the radula of *C. frigidus* to be separable from that of *C. flavidus*.

25. *Conus generalis* LINNAEUS, 1767

(Plate 12, Figure 8)

1758. *Conus capitaneus* var. *generalis* LINNAEUS, Syst. Nat., ed. 10, p. 713, no. 254

1767. *Conus generalis* LINNAEUS, Syst. Nat., ed. 12, p. 1166, no. 293

1792.[?] *Conus monile* HWASS in BRUGUIÈRE, Encycl. Méth. Vers, 1: 646

1798. *Cucullus cereolus* RÖDING, Mus. Bolten., p. 44

1798. *Cucullus dux* RÖDING, Mus. Bolten., p. 44 [non *Conus dux* HWASS in BRUGUIÈRE, 1792]

1798. *Cucullus ornatus* RÖDING, Mus. Bolten., p. 44

1798. *Cucullus locumtenens* RÖDING, Mus. Bolten., p. 45 [non *Conus locumtenens* BLUMENBACH, 1791]

1807. *Conus cinctus* LINK, Besch. Nat. Samml. Univ. Rostock, Abt. 3, p. 102 [non *C. cinctus* BOSCH, 1801]

1863. *Conus spirogloxus* DESHAYES, Conch. Île Reunion, p. 135, pl. 13, figs. 13, 14

**Shell:** Shell narrow, elongate. Body whorl reddish-brown to dark brown, ornamented with irregular, somewhat squarish white blotches, often fused together to form 3 white transverse bands at shoulder, center and base; extremely fine and close-set spiral striae extend from base to shoulder, base faintly stained with violet-brown. Shoulder sharply angulate, smooth, spire depressed, extremely concave, early whorls acuminate, slightly canaliculate. Aperture narrow, slightly waisted centrally, interior whitish, anteriorly stained dark violet-brown.

Periostracum dark grey, thick and smooth.

**Type locality:** India orientali.

H: 45 to 75 mm; W: 41 to 52%; HS: 7 to 12%; AA: 120° to 130°

**Habitat:** In patches of sand, under coral on sand substrate, in shallow water. Uncommon.

**Distribution:** Throughout Fiji. - Indo-West Pacific.

**Discussion:** The white transverse bands will vary in width, and occasionally only one or two transverse zones are visible.

26. *Conus geographus* LINNAEUS, 1758

(Plate 15, Figure 37)

1758. *Conus geographus* LINNAEUS, Syst. Nat., ed. 10, p. 718, no. 283

1798. *Cucullus geographicus* RÖDING, Mus. Bolten., p. 39

1833. *Conus rosea* SOWERBY, Conch. Illust., pt. 32, fig. 33

1843. *Conus intermedius* REEVE, Conch. Icon., 1: pl. 23, spec. 129 [non *Conus intermedius* LAMARCK, 1810]

1858. *Conus mappa* CROSSE, Rev. Mag. Zool., (2), 10: 200 & 205 [non *Conus mappa* SOLANDER, 1786]

**Shell:** Shell large, thin. Body whorl pale brown to dark brown, ornamented with white or bluish-white, irregular trigonal or rhomboidal small blotches; these are arranged in such a manner as to form 2 to 4 transverse zones on the body whorl. Shoulder angulate, distinctly coronate, spire low, concave, whitish, flecked and axially lined with brown; apex pointed. Aperture very wide, flaring basally, lip thin, interior bluish-white.

Periostracum thin, smooth, translucent yellowish-orange.

**Type locality:** In Indiis.

H: 44 to 127 mm; W: 45 to 52 %; HS: 7 to 11%; AA: 110° to 125°

**Habitat:** Under coral on sand substrate, in deeper water; rarely collected in shallow water. Rare.

**Distribution:** Throughout Fiji. - Indo-West Pacific.

**Discussion:** The species is piscivorous in nature; it is extremely toxic and usually lethal to human beings. Nine cases of stinging have been recorded, and five of these resulted in death (KOHNS, 1963).

27. *Conus glans* HWASS in BRUGUIÈRE, 1792

(Plate 17, Figure 60)

1792. *Conus glans* HWASS in BRUGUIÈRE, Encycl. Méth. Vers, 1: 735

1937. *Conus glans* var. *tenuigranulata* DAUTZENBERG, Mém. Mus. Roy. Hist. Nat. Belg., 2 (18), pl. 1, fig. 11

**Shell:** Shell small. Body whorl dark purplish-brown, with a central bluish-white transverse band, and occasionally another faint light band below the shoulder; shell distinctly concave near the base, ornamented with coarse, interrupted revolving ridges from base to shoulder. Shoulder rounded, smooth, spire elevated, slightly convex, pale purple, apex nipple-like; whorls with three pronounced spiral striae. Aperture bulbous, narrow near shoulder, but widening basally; interior of aperture purple.

Periostracum smooth, transversely minutely ridged, dark greyish-brown, thin and opaque.

**Type locality:** Africa.

H: 17 to 32 mm; W: 46 to 54%; HS: 18 to 21%; AA: 80° to 100°

Habitat: Under coral on reef substrate, in shallow water.  
Uncommon.

Distribution: Throughout Fiji. - Indo-West Pacific.

28. *Conus imperialis* LINNAEUS, 1758

(Plate 12, Figure 11)

1758. *Conus imperialis* LINNAEUS, Syst. Nat., ed. 10, p. 712, no. 251

1798. *Cucullus corona-ducalis* RÖDING, Mus. Bolten., p. 38

1798. *Cucullus regius* RÖDING, Mus. Bolten., p. 38 [non *Conus regius* GMELIN, 1791]

1810. *Conus viridulus* LAMARCK, Ann. Mus. Hist. Nat. Paris, 15: 31

1906. *Conus queketti* SMITH, Ann. Natal Govt. Mus., 1: 22, pl. 7, fig. 1

1933. *Conus imperialis nigrescens* BARROS & CUNHA, Mem. Estud. Mus. Zool. Univ. Coimbra, ser. 1, no. 71, p. 17 [non *C. nigrescens* SOWERBY, 1859]

1933. *Conus imperialis flavescens* BARROS & CUNHA, Mem. Estud. Mus. Zool. Univ. Coimbra, ser. 1, no. 71, p. 18 [non *C. flavescens* SOWERBY, 1834]

**Shell:** Shell large, solid, slightly elongate. Body whorl white or cream, ornamented with two broad, orange-brown transverse bands, the band below the shoulder being the broader; dark brown, interrupted lines composed of dashes and dots, encircle the body whorl. Shoulder angulate, distinctly coronate, spire low, often flat, apex rounded or eroded. Aperture narrow, lip thin, waisted centrally; interior white or bluish-white, basally stained with pale violet.

Periostracum smooth, orange, moderately thin.

Type locality: None.

H: 22 to 106 mm; W: 50 to 60%; HS: 1 to 9%; AA: 145° to 180°

Habitat: Under coral buried in sand, in sandy pockets of coral reefs, in shallow water. Uncommon.

Distribution: Throughout Fiji. - Indo-West Pacific.

Discussion: This species feeds on polychaete annelids in nature (KOHN, 1963).

29. *Conus insculptus* KIENER, 1845

(Plate 16, Figures 55, 55 a)

1845. *Conus insculptus* KIENER, Spéc. Gén. Icon. Coq. Viv., p. 309, pl. 99, fig. 2

**Shell:** Shell small, fusiform, with a distinctly attenuated base. Body whorl fawn to pale brown, ornamented with two or three transverse bands, consisting of brown squarish blotches; shell sculptured with fairly close-set spiral grooves from base to shoulder, grooves being punctured and traversed by axial cancellations. Shoulder angled, smooth, spire very high, concave to straight, maculated with brown blotches; whorls are terraced, spirally finely striate, striae interrupted by close-set, fine axially curved lines. Aperture very narrow, lip thin and recurved, interior of aperture pink.

Type locality: La mer de Chine.

H: 16 to 34 mm; W: 36 to 43%; HS: 20 to 30%; AA: 55° to 75°

Habitat: Dredged from 15 fathoms, on sand and coral rubble bottom. Rare.

Distribution: Mamanuca group, West of Viti Levu. - Philippines.

Discussion: Fiji specimens compare favorably with KIENER's description and illustration, except for one or two points. KIENER describes the transverse grooves as "punctured," but fails to mention the close-set axial ridges inside the grooves, which characterize this species and which he uses describing *Conus aculeiformis* REEVE, 1844. He further mentions 8 whorls on the spire for this species, whereas Fiji specimens have 10 to 11 whorls. He also describes his *C. insculptus* as rusty-brown in colour throughout, a fact which applies to Philippine specimens of this species, but not to those from Fiji. REEVE (1849) illustrates and describes KIENER's *C. insculptus* as a shell with fine small coronations at the shoulder. *Conus insculptus*, however, is a non-coronate species.

Philippine specimens of *Conus insculptus* match KIENER's illustration and description very closely. Apart from the different colour pattern, Fiji specimens agree with those from the Philippines in form, sculpture and size, and hardly justify a specific separation.

### Explanation of Plate 16

Figure 46: *Conus sugillatus* REEVE. Fiji (x 1.0)

Figure 47: *Conus frigidus* REEVE. Fiji (x 1.0)

Figure 48: *Conus flavidus* LAMARCK. Fiji (x 0.85)

Figure 49: *Conus balteatus* SOWERBY. Fiji (x 1.35)

Figure 50: *Conus lividus* HWASS. Fiji (x 0.85)

Figure 51: *Conus sanguinolentus* QUOY & GAIMARD.  
Fiji (x 1.0)

Figure 51a: *Conus sanguinolentus* QUOY & GAIMARD.  
Mauritius (x 1.0)

Figure 51b: *Conus sanguinolentus* QUOY & GAIMARD.  
Formosa Bay, Kenya (x 1.0) photo, Dr. W.R. Barker.

Figure 52: *Conus moreleti* CROSSE. Fiji (x 1.0)





Figure 46

Figure 47



Figure 48

Figure 49

Figure 50



Figure 51

Figure 51 a

Figure 51 b

Figure 52





30. *Conus lachrymosus* REEVE, 1849

(Plate 18, Figures 64, 66, 66 a, 66 b, 66 c, 66 d)

1849. *Conus lachrymosus* REEVE, Conch. Icon., Suppl., pl. 6, spec. 2581849. *Conus rivularius* REEVE, Conch. Icon., Suppl., pl. 6, spec. 261

**Shell:** Shell small, moderately thin. Body whorl white, occasionally cream, ornamented with irregular yellow, orange or reddish-brown blotches and flammules; the design may be continuous from shoulder to base, or interrupted at the shoulder and center, to form two ill-defined, white transverse zones. Some specimens bear close-set transverse lines of dots of the same colour as the pattern, while other specimens lack this feature; the body whorl is transversely striate, striae often granulose at the base, becoming either obsolete or continuous towards the shoulder. Widely spaced reddish-brown spots are positioned on top of the spiral ridges at the base. Shoulder angulate, occasionally slightly rounded, obsoletely nodulose, rarely smooth, spire depressed, concave, or straight to slightly convex, white in colour with orange or brown maculations; apex raised and papillate, if not eroded. Whorls bear 3 to 4 spiral striae, and intervening spaces are axially cancellate. Aperture moderately narrow, lip thin, interior of aperture white or faintly pink.

Juvenile shells are white and waxy in appearance, with continuous longitudinal flammules from shoulder to base, and faint transverse rows of orange spots; the shoulder is distinctly angulate and spire extremely concave, the early whorls sub-coronate.

Periostracum thin, pinkish-orange to reddish-orange, moderately translucent, sometimes opaque, and transversely ridged and tufted.

Egg cases are very pale pink, oval in shape, well separated from each other; they measure approximately 6.5 mm in height, 4.8 mm in width and 1.6 mm in thickness.

**Type locality:** None. ("Moluccas" for *Conus rivularius*)  
H: 12 to 25 mm; W: 48 to 57%; HS: 12 to 18%;  
AA: 90° to 115°

**Habitat:** Under coral, on sand and weed substrate, in shallow water. Moderately common in the Mamanuca group, West Viti Levu, but rare elsewhere.

**Distribution:** Throughout Fiji.

**Discussion:** TOMLIN (1937) synonymized *Conus lachrymosus* and *C. rivularius* with *C. boeticus* REEVE, 1844. REEVE's type figure of *C. boeticus* shows a shell with a distinctly rounded and sub-coronate shoulder, and a very high, straight to slightly convex spire, and lacking the high, obtuse, nipple-like apex of Fiji specimens; REEVE's type figure measures about 37.5 mm, whereas the largest

specimen collected in Fiji is only 24.8 mm in height. REEVE's type specimens, mounted on a tablet in the British Museum, are accompanied by note: "This is the true *adansonii* of LAMARCK" (fide TOMLIN, 1937).

From the large series of shells available for study, it became apparent that the species is extremely variable; the majority of shells, however, falls within the pattern of *Conus lachrymosus* and *C. rivularius*, and not one shell was found to resemble REEVE's *C. boeticus*.

Two other species, often associated with *Conus boeticus*, are *C. piperatus* REEVE, 1844 (non DILLWYN, 1817), later renamed *C. dillwyni* by REEVE in his Emendations (1848, p. 2), and *C. ruppelli* REEVE, 1848. These two are somewhat similar in appearance; however in *C. dillwyni* the interior of the aperture is brown, besides differing in pattern and other features, and *C. ruppelli* has distinct white coronations with brown interstices. I would hesitate to associate these two species with *C. lachrymosus*.

*Conus cerinus* REEVE, 1848 (Suppl. pl. 3, figs. 283 a, 283 b), and *C. eximius* REEVE, 1849 (Suppl. pl. 6, fig. 256) also resemble *C. lachrymosus*; further study and comparison of REEVE's type specimens could prove them to be identical.

31. *Conus leopardus* (RÖDING, 1798)

(Plate 12, Figure 1)

1798. *Cucullus leopardus* RÖDING, Mus. Bolten., p. 411822. *Conus millepunctatus* LAMARCK, Hist. Nat. Anim. s. Vert., 7: 461 (non *Cucullus millepunctatus* RÖDING, 1798)1937. *Conus millepunctatus* var. *aldrovandi* DAUTZENBERG, Mém. Mus. Roy. Hist. Nat. Belg., 2 (18): 171 (non *C. aldrovandi* Risso, 1826)

**Shell:** Shell large and heavy. Body whorl cream to ivory, ornamented with transverse rows of blackish-brown, longitudinally oblong spots; base white, truncate and folded. Shoulder rounded, smooth, spire low, blunt, white and flecked with blackish-brown blotches; small specimens have sub-canalicate whorls. Aperture narrow, interior white.

Periostracum greenish-brown, smooth and very thick.

Egg capsules are large, oval, ridged and white in colour; capsules measured approximately 26 mm in height, 19 mm in maximum width and 6 mm in thickness; they were deposited on the substrate in rows.

**Type locality:** None. ("Ocean Asiatique," LAMARCK, 1822).

H: 40 to 150 mm; W: 56 to 67%; HS: 3 to 9%;  
AA: 130° to 160°

**Habitat:** In patches of sand, often exposed, in shallow water. Common.

**Distribution:** Throughout Fiji. - Indo-West Pacific.

**Discussion:** The species differs from *Conus litteratus* in being larger, with a slightly different shape and arrangement of the blackish-brown blotches, truncated white base, more rounded shoulder, and lacking the transverse yellow bands and larger squarish blotches at the shoulder.

32. *Conus litoglyphus* HWASS in BRUGUIÈRE, 1792  
(Plate 17, Figure 61)

1792. *Conus litoglyphus* HWASS in BRUGUIÈRE, Encycl. Méth. Vers, 1: 692

1798. *Cucullus cinamomeus* RÖDING, Mus. Bolten., p. 43

1798. *Cucullus cinamomeus* RÖDING, Mus. Bolten., p. 43

1798. *Cucullus orleanus* RÖDING, Mus. Bolten., p. 44

1807. *Conus subcapitaneus* LINK, Beschr. Nat. Samml. Univ. Rostock, Abt. 3, p. 103

1845. *Conus lacinulatus* KIENER, Spéc. Gén. Icon. Coq. Viv., 2: 312, pl. 108, fig. 2

1865. *Conus carpenteri* CROSSE, Journ. Conchyl., Paris, 13: 302, pl. 9, fig. 1

**Shell:** Shell elongate and conical. Body whorl yellowish-brown to chestnut brown, with two white transverse bands at shoulder and center; the central band is either continuous or interrupted, while the shoulder band is composed of irregular white blotches. Base bears 3 to 5 coarse spiral ridges which are sometimes granulose and stained with dark brown. Shoulder angulate, smooth, spire depressed, concave to straight, flecked with brown and white; whorls channeled and axially cancellate. Aperture straight and narrow, stained dark brown near the base, interior white.

Periostracum light brown, transversely ridged and translucent.

**Type locality:** Mers des grandes Indes.

H: 30 to 42 mm; W: 48 to 56%; HS: 8 to 13%; AA: 115° to 140°

**Habitat:** Under coral, on sand or reef substrate in deeper water, rarely in shallow water. Rare.

**Distribution:** West and South Viti Levu. - Indo-West Pacific.

**Discussion:** COTTON's illustration of *Conus daucus* HWASS in BRUGUIÈRE (1945, pl. 1, fig. 9) appears to represent *C. litoglyphus* HWASS in BRUGUIÈRE.

33. *Conus litteratus* LINNAEUS, 1758

(Plate 12, Figure 2)

1758. *Conus litteratus* LINNAEUS, Syst. Nat., ed. 10, p. 712, no. 252

1798. *Cucullus byssinus* RÖDING, Mus. Bolten., p. 41

1798. *Cucullus pardus* RÖDING, Mus. Bolten., p. 41

1840. *Conus brevis* J. DE C. SOWERBY, Tr. Geol. Soc. London, (2) 5 (2): 329, pl. 26, fig. 33

1844. *Conus gruneri* REEVE, Conch. Icon., 1, pl. 43, spec. 231

**Shell:** Shell large, solid. Body whorl cream to ivory, ornamented with transverse rows of blackish-brown, usually rhomboidal spots; occasionally 1 to 3 narrow transverse yellow bands encircle the body whorl. Base pointed, stained with violet-brown. Shoulder distinctly angulate, smooth, with larger squarish, blackish-brown blotches which extend onto the body whorl; spire low, almost flat. Aperture narrow, white within.

**Type locality:** O. asiatico.

H: 60 to 94 mm; W: 52 to 58%; HS: 5 to 9%; AA: 140° to 165°

**Habitat:** In patches of sand, in deeper water, rarely collected in shallow water. Moderately rare.

**Distribution:** Throughout Fiji. - Indo-West Pacific.

**Discussion:** The species differs from *Conus leopardus* RÖDING in being generally smaller, having an almost flat spire, angular shoulder, and pointed base stained with violet-brown, and occasionally yellow transverse bands.

34. *Conus lividus* HWASS in BRUGUIÈRE, 1792

(Plate 16, Figure 50)

1792. *Conus lividus* HWASS in BRUGUIÈRE, Encycl. Méth. Vers, 1: 630

1798. *Cucullus monachos* RÖDING, Mus. Bolten., p. 39

1807. *Conus plebejus* LINK, Beschr. Nat. Samml. Univ. Rostock, Abt. 3, p. 106

**Shell:** Shell solid, conical. Body whorl olive-brown, with two white or bluish-white transverse bands at shoulder and center; body whorl striate, striae granulose basally, obsolete towards the shoulder, base stained with purple. Shoulder angulate, coronate, spire white, slightly elevated, often eroded; whorls obsoletely striate. Aperture narrow,

### Explanation of Plate 17

Figure 53: *Conus moluccensis* KÜSTER. Fiji (x 1.25)

Figure 54: *Conus acutangulus* LAMARCK. Fiji (x 1.4)

Figure 55: *Conus insculptus* KIENER. Fiji (x 1.5)

Figure 55a: *Conus insculptus* KIENER. Maqueda Bay, Samar, Philippine Islands (x 1.6)

Figure 56: *Conus pertusus* HWASS. Fiji (x 1.7)

Figure 62: *Conus dilectus* GOULD. Fiji (x 2.8)

Figure 57: *Conus nussatella* LINNAEUS. Fiji (x 0.85)

Figure 58: *Conus cylindraceus* BRODERIP & SOWERBY. Fiji (x 1.8)

Figure 59: *Conus mitratus* HWASS. Fiji (x 1.6)

Figure 60: *Conus glans* HWASS. Fiji (x 1.5)

Figure 61: *Conus litoglyphus* HWASS. Fiji (x 1.0)





Figure 53

Figure 54

Figure 55



Figure 55 a

Figure 56

Figure 57

Figure 58

Figure 59



Figure 60

Figure 61

Figure 62



interior purple, with a light band near shoulder and one in the center.

Periostracum brown, smooth and thick.

All parts of the animal are black, finely spotted with red.

**Type locality:** Antilles [error], Île de France (Mauritius), Indes orientales.

H: 25 to 60 mm; W: 53 to 59%; HS: 8 to 19%; AA: 105° to 140°

**Habitat:** Under coral, on reef and sand substrate, and in crevices of coral reef platforms, often exposed at low tide. Common.

**Distribution:** Throughout Fiji. - Indo-West Pacific.

**Discussion:** In nature the species feeds on polychaete annelids and enteropneusts (Kohn, 1963).

### 35. *Conus magus* LINNAEUS, 1758

(Plate 15, Figure 41)

1758. *Conus magus* LINNAEUS, Syst. Nat., ed. 10, p. 716, no. 276

1792. *Conus raphanus* HWASS in BRUGUIÈRE, Encycl. Méth. Vers, 1: 722

1798. *Cucullus caesi*us RÖDING, Mus. Bolten., p. 48

1822. *Conus carinatus* SWAINSON, Zool. Illust., 2, pl. 112

1844. *Conus epistomium* REEVE, Conch. Icon. 1: pl. 42, spec. 227

1844. *Conus ustulatus* REEVE, Conch. Icon., 1: pl. 44, spec. 239

1845. *Conus striolatus* KIENER, Spéc. Gén. Coq. Viv., 2: 266, pl. 105, fig. 1

1857.[?] *Conus adansonii* SOWERBY, Thes. Conch. 3: 38, pl. 199, figs. 286, 287, 288, 289 (non *Conus adansonii* LAMARCK, 1810)

1860. *Conus rollandi* BERNARDI, Journ. Conchyl., Paris, 8: 332, pl. 12, fig. 4

1864.[?] *Conus consul* BOIVIN, Journ. Conchyl., Paris, 12: 33, pl. i, figs. 5, 6

1865.[?] *Conus signifer* CROSSE, Journ. Conchyl., Paris, 13: 308, pl. 10, fig. 6

1866. *Conus tasmaniae* SOWERBY, Thes. Conch., 3: 328, pl. 27, fig. 636

1866. *Conus borneensis* SOWERBY, Thes. Conch., 3: 329, pl. 28, fig. 648 (non *Conus borneensis* ADAMS & REEVE, 1848)

1875.[?] *Conus epistomioides* WEINKAUFF, Syst. Conch. Cab., (2), Lief. 233, p. 315, pl. 57, figs. 5, 6

1910. *Conus magus* var. *decurtata* DAUTZENBERG, Journ. Conchyl., Paris, 58: 26

**Shell:** Shell elongate. Body whorl white to cream, ornamented with large, irregular green to olive-brown or blackish-brown blotches, usually arranged longitudinally; numerous black and white revolving lines are superimposed on the pattern, which is at times interrupted to

form a white central band. The base has a few strong, oblique ridges. Shoulder slightly angulate, at times slightly rounded, smooth, spire depressed or slightly elevated, concave to straight, flecked with dark brown and white; whorls bear three distinct spiral striae. Aperture narrow, widening basally, interior white.

Periostracum light brown, smooth and moderately translucent to opaque in adults, fawn to pale brown, minutely ridged and tufted in juvenile specimens.

Juvenile specimens are pale fawn, with a minimum of brown blotches.

**Type locality:** None. ("Indian Ocean," HWASS in BRUGUIÈRE, 1792).

H: 16 to 60 mm; W: 46 to 53%; HS: 14 to 18%; AA: 95° to 110°

**Habitat:** Under coral, on sand substrate, in shallow water; juveniles are found buried in sandy patches. Common.

**Distribution:** Throughout Fiji. - Indo-West Pacific.

**Discussion:** Dr. Kohn (personal communication) found the radular teeth of Fijian specimens of *Conus magus* to be proportionately longer in relation to shell length (1:10), than those from the Philippines and Eniwetok (1:13 to 1:15).

This is an extremely variable species, which will vary in colour and pattern from region to region; even within the Fiji Islands various colour forms are found. An extensive synonymy for this species can be found in DAUTZENBERG, 1937.

### 36. *Conus marmoreus* LINNAEUS, 1758

(Plate 12, Figure 9)

1758. *Conus marmoreus* LINNAEUS, Syst. Nat., ed. 10, p. 712, no. 250

1798. *Cucullus equestris* RÖDING, Mus. Bolten., p. 38 (non *C. equestris* RÖDING, 1798, p. 46)

1798. *Cucullus proarchithalassus* RÖDING, Mus. Bolten., p. 38

1798. *Cucullus torquatus* RÖDING, Mus. Bolten., p. 38 (non *C. torquatus* RÖDING, 1798, p. 45)

1811. *Conus maculatus* PERRY, Conchology, pl. 24, fig. 4

1859. *Conus nigrescens* SOWERBY, Proc. Zool. Soc. London, pt. 27: 429, pl. 49, fig. 2

1875. *Conus pseudomarmoreus* CROSSE, Journ. Conchyl., Paris, 23: 223, pl. 9, fig. 4

**Shell:** Shell conical, solid, heavy. Body whorl blackish, ornamented with ivory-white, trigonal blotches of varying sizes from base to shoulder. Shoulder angulate, coronate, spire depressed, alternately flecked with black and white; whorls canalliculate, smooth. Aperture narrow, slightly wider basally, interior pinkish-white.

Periostracum smooth, thin, translucent orange.



Juvenile specimens have pronounced transverse ridges on the body whorl.

**Type locality:** Asia.

H: 30 to 102 mm; W: 53 to 59%; HS: 4 to 13%; AA: 125° to 150°

**Habitat:** Under coral, on sand substrate and among weed, in shallow water. Common.

**Distribution:** Throughout Fiji. - Indo-West Pacific.

**Discussion:** Semi-albino and albino specimens of *Conus marmoreus* have been recorded from Bourail, New Caledonia. The frequent occurrence of albinotic specimens in this particular population points to genedrift as a possible cause. Albinotic or melanistic specimens of *C. marmoreus* have not been recorded from Fiji waters.

The species has been observed to be molluscivorous in nature, and in all probability has a venomous sting harmful to vertebrates.

### 37. *Conus miles* LINNAEUS, 1758

(Plate 12, Figure 7)

1758. *Conus miles* LINNAEUS, Syst. Nat., ed. 10, p. 713, no. 255

**Shell:** Shell solid, broad. Body whorl white, ornamented with orange to orange-brown, longitudinal wavy lines, and one narrow dark brown transverse band below the shoulder and another, broader band at the base; base bears widely spaced spiral ridges. Shoulder angulate, smooth, spire moderately elevated, concave or straight, white and axially lined with orange brown lines; whorls obsoletely striate. Aperture narrow, lip thin, interior violet, with a light band at shoulder and another above the base.

Periostracum greenish-brown, thick, ridged, tufted.

**Type locality:** India.

H: 26 to 76 mm; W: 56 to 67%; HS: 11 to 16%; AA: 105° to 125°

**Habitat:** Under coral, on reef substrate, in shallow water. Common.

**Distribution:** West, South and East Viti Levu. - Indo-West Pacific.

**Discussion:** Egg capsules are small, ridged and white in colour; capsules measured approximately 9.5 mm in

height and 6.0 mm in maximum width; they were laid on the substrate in parallel rows.

KOHN (1959) recorded Hawaiian specimens of *Conus miles* as obsoletely coronate at the shoulder; this is not the case in Fiji specimens.

### 38. *Conus miliaris* HWASS in BRUGUIÈRE, 1792

(Plate 18, Figure 72)

1792. *Conus miliaris* HWASS in BRUGUIÈRE, Encycl. Méth. Vers, 1: 629

**Shell:** Shell small, solid. Body whorl rose-pink, ornamented with two interrupted transverse bands, composed of irregular white blotches; numerous interrupted orange-brown lines revolve around the body whorl. Transverse granulose ridges extend from the base halfway towards the shoulder. Shoulder angulate, coronations white and distinct, interspaces with short orange-brown streaks; spire low or slightly elevated, white and coronate. Whorls bear two distinct spiral ridges. Aperture narrow, slightly widening basally, interior orange-brown, with a white median band.

Periostracum thin, smooth, translucent orange.

**Type locality:** China.

H: 15 to 36 mm; W: 61 to 70%; HS: 7 to 15%; AA: 120° to 145°

**Habitat:** Under coral, on sand substrate and sand pockets of coral reefs in shallow water. Uncommon.

**Distribution:** West, South and East Viti Levu. - Indo-West Pacific.

### 39. *Conus mitratus* HWASS in BRUGUIÈRE, 1792

(Plate 17, Figure 59)

1792. *Conus mitratus* HWASS in BRUGUIÈRE, Encycl. Méth. Vers, 1: 738

1870. *Conus mitraeformis* SOWERBY, Proc. Zool. Soc. London, p. 256

**Shell:** Shell small, elongate-cylindrical. Body whorl cream, ornamented with orange-brown rectangular blotches arranged to form three interrupted transverse bands at the base, center and shoulder; distinct small granules are placed transversely on the body whorl, and extend from

## Explanation of Plate 18

Figure 63: Type figure of *Conus eximius* REEVE, 1849

Figure 64: Type figure of *Conus lachrymosus* REEVE, 1849

Figure 65: Type figure of *Conus rivularius* REEVE, 1849 (figures 63, 64 and 65 x 1.4)

Figure 66: *Conus lachrymosus* REEVE. Fiji (x 1.85)

Figure 66a: *Conus lachrymosus* REEVE, almost white, sparsely ornamented specimen. Fiji (x 1.7)

Figure 66b: *Conus lachrymosus* REEVE. Fiji (x 1.85)

Figure 66c: *Conus lachrymosus* REEVE. juvenile. Fiji (x 2)

Figure 66d: enlarged view of *Conus lachrymosus* REEVE,

showing degree of nodulosity of shoulder and spire (approximately x 3.0)

Figure 67: *Conus aristophanes* SOWERBY. Fiji (x 1.35)

Figure 68: *Conus coronatus* GMELIN. Fiji (x 1.0)

Figure 69: *Conus ebraeus* LINNAEUS. Fiji (x 0.9)

Figure 70: *Conus chaldaeus* (RÖDING). Fiji (x 1.0)

Figure 71: *Conus sponsalis* HWASS. Fiji (x 1.1)

Figure 72: *Conus miliaris* HWASS. Fiji (x 1.0)

Figure 73: *Conus musicus* HWASS. Fiji (x 1.3)

Figure 74: *Conus rattus* HWASS. Fiji (x 0.7)

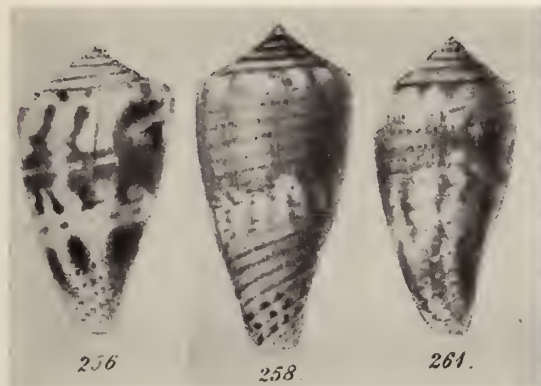


Figure 63

Figure 64

Figure 65

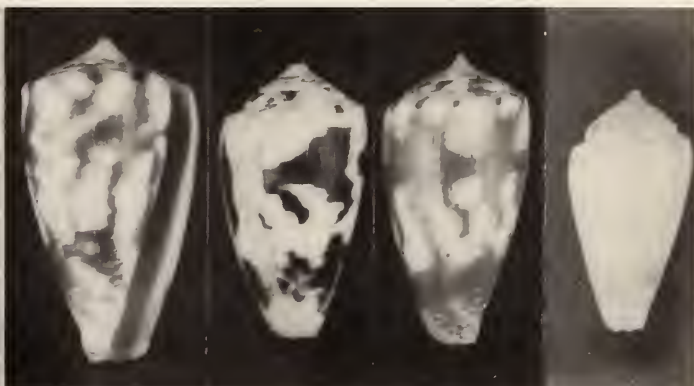


Figure 66

Figure 66 a

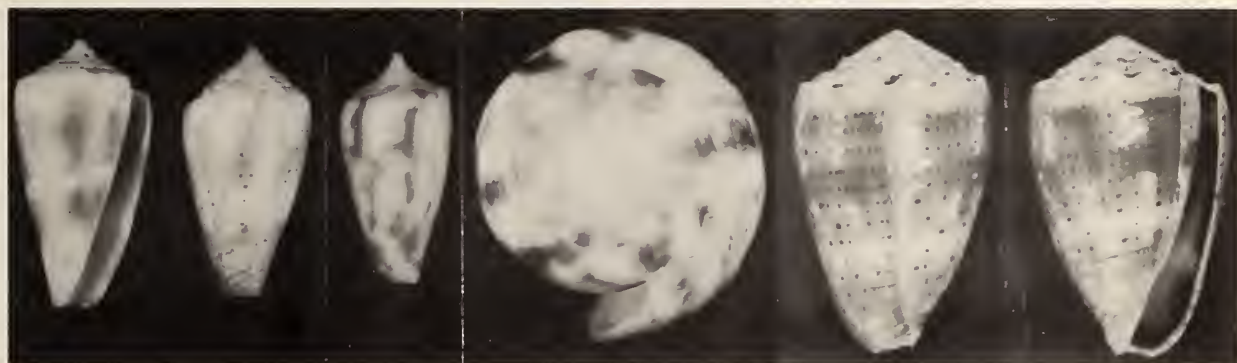


Figure 66 b

Figure 66 c

Figure 66 d

Figure 67

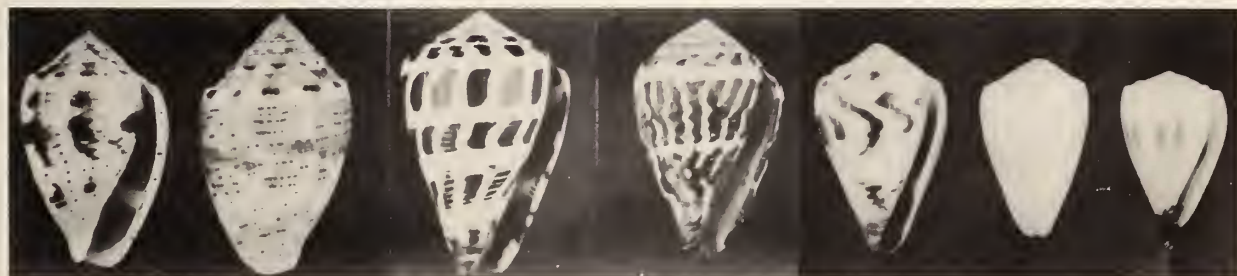


Figure 68

Figure 69

Figure 70

Figure 71



Figure 72

Figure 73

Figure 74

